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DERWENT-WEEK: 198611  
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TITLE: Heat energy storage tank - contains mixt. of polysaccharide and saline inorganic salt

PATENT-ASSIGNEE: MITSUI PETROCHEM IND CO LTD[MITC]

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PATENT-FAMILY:

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JP 61022194 A	January 30, 1986	N/A	005	N/A
JP 91081076 B	December 26, 1991	N/A	000	N/A

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP61022194A	N/A	1984JP-0141446	July 10, 1984
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INT-CL (IPC): C09K005/06; F28D020/00 ; F28F023/02

ABSTRACTED-PUB-NO: JP61022194A

BASIC-ABSTRACT: Material (6) storing thermal energy is formed by mixing hydrophilic polysaccharide (e.g. cellulose, glycogen, etc) and saline inorganic salt soln. (e.g. lithium nitrate, sodium sulphate, etc). It is charged into closed vessel (1) with installed pipelike exciter (3) in lower-portion, crystalliser (7) in upper portion, and coil-spring (5) at its ceiling-portion. Material charged in exciter is solidified by crystalliser and thermal energy is removed by pushing down exciter against coil-spring so as to bring material of exciter into contact with material of closed vessel, by making solidified material core.

USE - For portable body-heater, room-heater, etc.

CHOSEN-DRAWING: Dwg. 1/1

TITLE-TERMS:

HEAT ENERGY STORAGE TANK CONTAIN MIXTURE POLYSACCHARIDE SALINE INORGANIC SALT

DERWENT-CLASS: G04 Q78

CPI-CODES: G04-B01;

UNLINKED-DERWENT-REGISTRY-NUMBERS: 1744U; 1821U

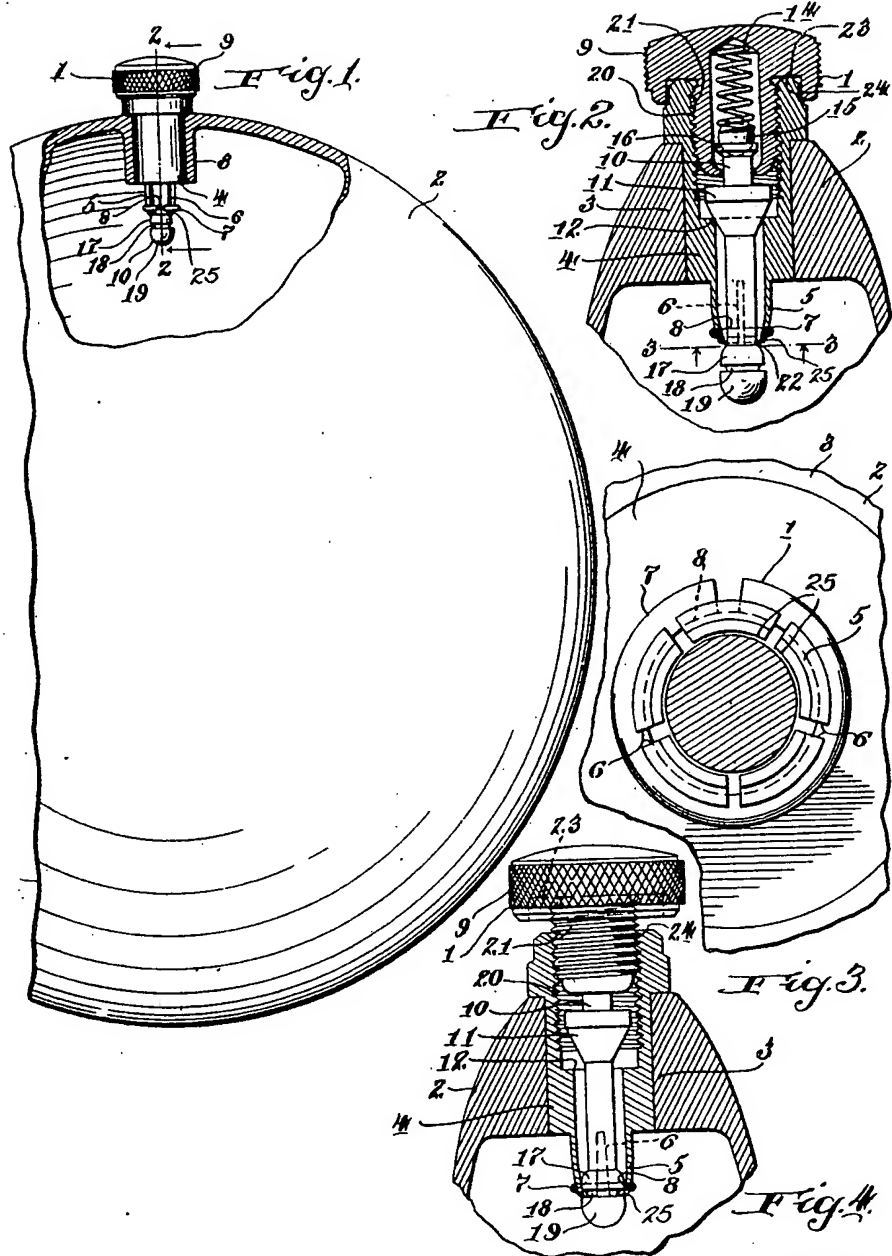
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1,836,162

VALVE CLOSURE FOR CONTAINERS

Filed Dec. 7, 1929

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## UNITED STATES PATENT OFFICE

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## VALVE CLOSURE FOR CONTAINERS

Application filed December 7, 1929. Serial No. 412,303.

The present invention relates to an improved form of closure or valve structure for containers and the like. In the present instance the valve structure is particularly adaptable to containers used specifically as hot water bottles, having therein for the purpose of creating heat, a chemical compound which in liquid state absorbs and contains a quantity of heat. For the purpose of releasing this heat and directing same to useful work, i. e., for heating the well known hot water bottle, the same may be released by admitting air thereto at atmospheric pressure through the valve structure which is the subject matter of the present application.

A particular object of the present invention is to provide a closure or valve structure for containers such as metal hot water bottles or the like, that is particularly adaptable for such containers when the same may have therein a chemical compound for the purpose of radiating heat through the walls of the hot water bottle by means of permitting air at atmospheric pressure to come in contact with the chemical compound, and one of the particular objects of the present invention is a valve structure for the purpose of creating a dual seal against the leakage of said chemical compound.

Another object of the present invention is to provide a closure for hot water bottles and the like, in the form of a valve structure having means therein for preventing the improper functioning of said valve structure due to crystallization of the chemical compound on the valve and in the valve passage, which in many instances completely stops or seriously interferes with the proper functioning of the valve for the purpose of admitting air to the chemical compound contained in the bottle.

Another object of the present invention is to provide a valve structure as and for the purpose as hereinbefore described, having means thereon for breaking up the crystallized chemical that may have affixed itself to that portion of the valve enclosed within the container and adjacent the inner valve passage, thus allowing for the proper entrance

of air at atmospheric pressure to the chemical compound within the bottle.

Another object of the present invention is to provide a valve structure having means thereon for wiping that portion of the valve structure which acts as a means for breaking up chemical crystallization about the inner air passage of same, thus allowing for the admittance of air to the chemical compound and also presenting a clean, dry surface about said means, thus preventing the crystallization of said compound about the air passage due to any moisture that may be on the said opening means, which would cause crystallization about this passage and stopping up the same before the proper amount of air could reach the compound to give the desired reaction to the chemical for the purpose of creating the maximum amount of radiated heat.

Another object of the present invention is to provide openings in the form of slots in the present invention of valve structure for the purpose of admitting air to the aforementioned chemical compound, said slots having means for breaking up the crystallization of said chemical compound about said slots for the purpose of freely admitting air to the chemical compound through said slots.

Still another object of the present invention is to provide yielding stop means to limit the stroke of the valve stem, thus preventing the entire withdrawal of the stem structure from the seat portion of the valve, when the same is opened.

Still another object of the present invention is to provide means for wiping and cleaning the surface of the member of the valve structure which acts to remove any obstructions to the passage of air through the valve during the normal opening and closing function of the valve.

Another object of the present invention is to provide a self cleaning valve structure having means thereon for preventing the stopping up of the inner valve passage during the normal opening operation of the valve.

With these and other objects in view, the invention consists of certain novel features, combination and arrangement of parts as will

12, the shoulder 17 is caused to move upwardly against the inwardly directed pressure of the scraping or wiping fingers 25. These fingers, as shown particularly in Figure 3, are formed into arcuate segments of the same circumferential curvature as the shoulder 17, thus when the shoulder 17 is forcefully pulled through the said fingers 25 by the opening of the valve, the surface of said shoulder 17 is substantially freed of all crystallized formation thereon, thus breaking up any stoppage at this portion of the inner valve air passage and thus allowing air at normal atmospheric pressure to pass downwardly in a free manner and into the inner chamber of the bottle 2. The stop groove 18, is provided for the purpose of acting as a stop for the fingers 25, when the valve stem has been screwed outwardly to a point where the fingers drop into the groove, thus preventing the complete removal of the valve and valve stem mechanism from the bottle, which is wholly unnecessary in this particular type of hot water bottle. It will be noted particularly in Figure 4, of the drawings, which illustrates the fingers 25 and slots 6, in a spread or open position, that due to the spreading of these parts any crystallized formation thereon of the chemical compound or heating agent would have a tendency to be broken up, thus allowing for an additional means for admitting air to the inner chamber of the bottle or to the heating agent, as heretofore described.

The operation of the valve is as follows: when it is desired to cause the hot water bottle to become heated, the valve head 9, is unscrewed slightly, thus unseating the upper and lower positive sealing seats 23 and 24, respectively. This unscrewing operation should be sufficient to unseat the yielding valve 11, from its valve seat 12, thus simultaneously causing the fingers 25 to scrape or wipe over the surface of the shoulder 17, breaking up any obstructions or crystallized formation that may have formed about this portion of the valve, i. e., the inner air passage, thus allowing the air to pass down through the threaded portions 20 and 21, past the valve 11, and valve seat 12, and thence through the inner air passage 22, and into the inner chamber of the hot water bottle, for the purpose of causing the chemical compound to release its stored up heat due to the air coming in contact with same. This operation is merely a matter of a few seconds when the valve head 9 is screwed downwardly to its normal closed position, thus causing the yielding and positive sealing means to tightly seal the valve passage in a dual manner for the purpose of preventing the hot chemical compound from escaping from the bottle.

In the commercial type of hot water bottle to which the invention is applied, the same

is sold with the necessary amount of heat producing chemical therein in a liquefied state, so that the bottle is always ready, when sold over the counter to the retail trade, to be initially heated merely by the introduction of air therein, which is accomplished by unscrewing the sealing valve slightly, as hereinbefore explained. This valve is then immediately screwed back to its original closed position and the bottle is ready for use as a heat unit, due to the immediate heating of the same caused by the reaction of the chemical therein as a result of the introduction of air thereto.

As the bottle and its enclosed chemical cool off, the chemical becomes a substantially solid compound and will not react when air is introduced thereto for purposes of creating heat. Thus the bottle with the solid chemical compound therein must be placed in hot water. Upon remaining in the hot water for a short period of time the solid chemical compound becomes liquefied, and remains in a liquefied state even after the same cools off providing the valve is kept closed and no air is permitted to enter the bottle. Thus the bottle may be set aside for an indefinite period of time, until it is necessary to use same again. Then for purposes of heating the bottle under conditions where fire is not readily available, it is only necessary to open the bottle valve sufficiently to admit a small amount of air, which sets up a violent reaction on the enclosed chemical and produces heat, causing the bottle to become very hot almost immediately.

With the above explained method of use of the hot bottle it may be readily seen that the same may be used as a hot bottle for an indefinite period of time. The use of the term "at atmospheric pressure" when referring to the introduction of air to the hot bottle is used merely in an arbitrary manner for purposes of indicating that the air admitted to the hot bottle may be ordinary atmospheric air found under normal atmospheric conditions.

Having thus described my invention, what I claim as new is:

1. A valve closure for containers having co-operative sealing means therein in the form of a yielding sealing means and a positive sealing means for the purpose of creating a dual sealing function in said valve, said yielding sealing means having means thereon for the purpose of engaging wiping means on the body of said valve closure, for the purpose of preventing the stoppage of the valve passage when the valve is normally open.

2. A closure for containers comprising threaded internal and external members, a valve seat in the external member and a valve yieldingly carried by the internal member for contact with said valve seat, said internal